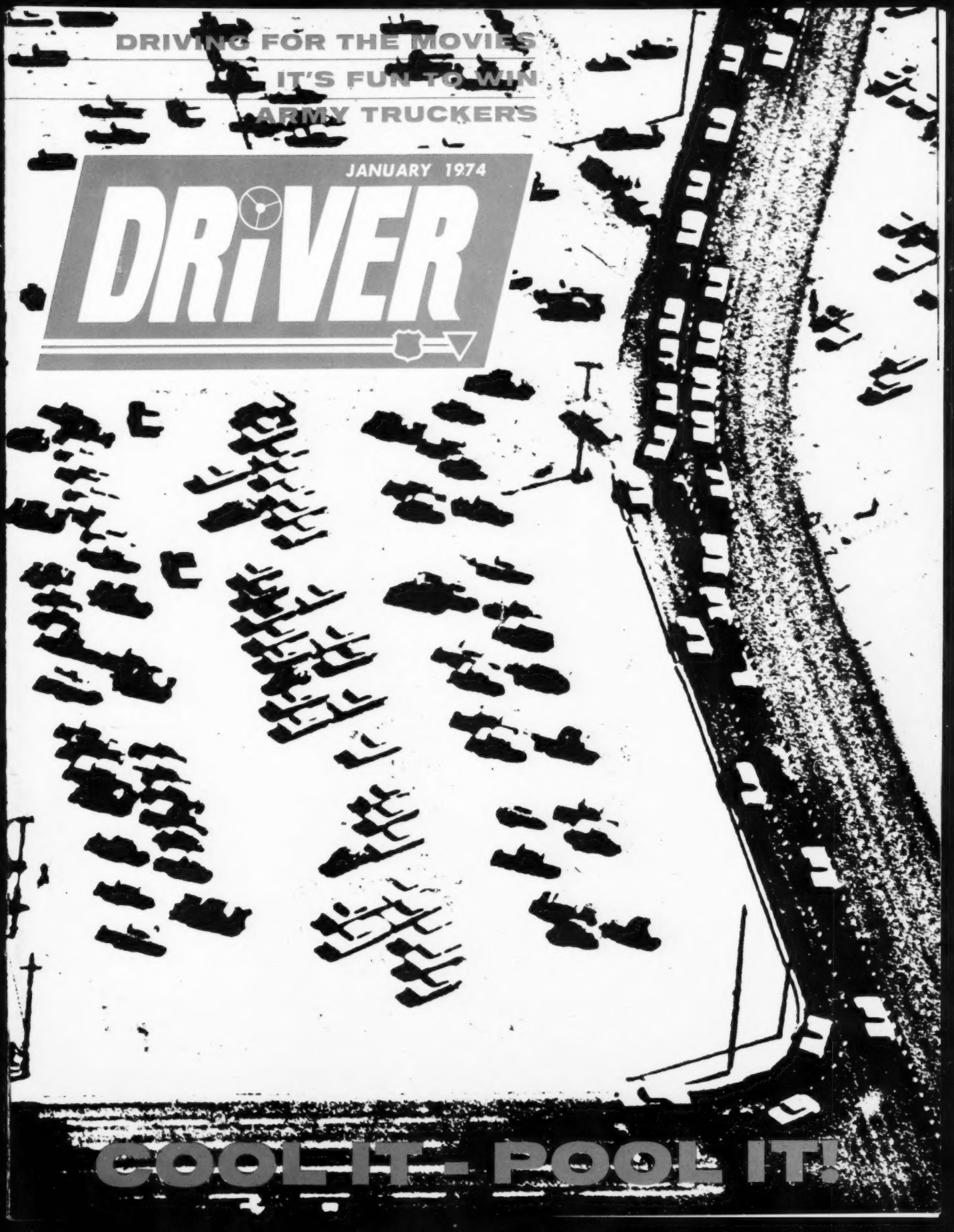
DRIVING FOR THE MOVIES

IT'S FUN TO WIN

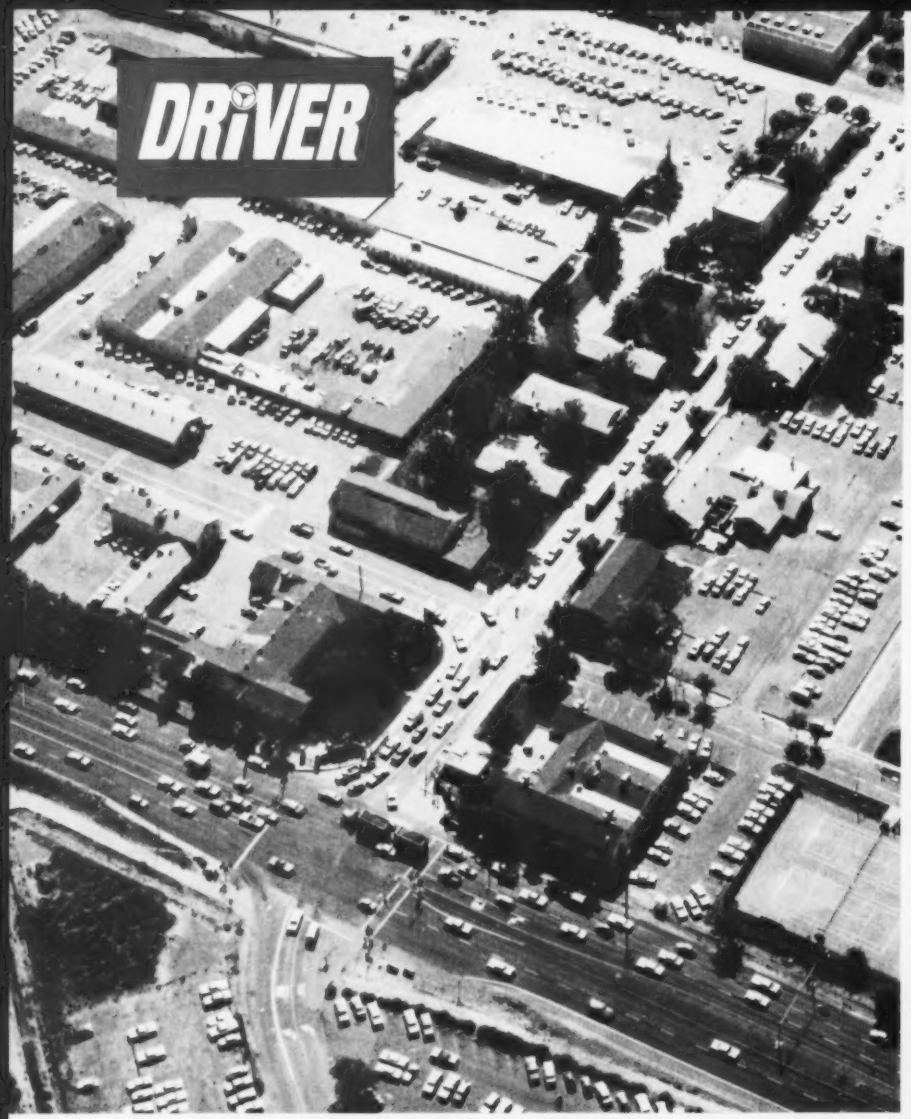
ARMY TRUCKERS

JANUARY 1974

DRIVER



COOL IT- POOL IT!



COOL IT-POOL IT!

by DONN BINDER

How not to run a car pool. Naturally, every passenger must be properly seated and have his own seat belt. (Don't worry—our photographer knows the rules. This is a **posed** picture in a **parked** vehicle at a **closed** gate!)

Carpools can conserve fuel . . . ease traffic jams . . . save you money. Care to share?

Although peak urban traffic periods rarely total 20 hours a week, Americans seem bent on using every second of them to jam major commuting routes full of cars carrying only their drivers. In fact, eight out of every ten workers in this nation drive to work. And 56 per cent of them ride alone.

Because of that, when we travel to or from work our streets and highways are over-populated with cars, while under-populated with people. That's also why we so often find ourselves sitting in the "rush hour crush" wondering how traffic ever got so bad!

This traffic crunch may have been tolerable (to some folks, that is) a few months ago, but now with the energy shortage it's a luxury we can't afford. Traffic jams cut into our fuel situation, so we have to cut out traffic jams—fast.

How? For openers we can organize carpools for commuting to and from work.

Carpooling is our only readily available means for immediately cutting rush hour traffic. And not only will carpooling cut traffic right away, but

continued

DRIVER

THE TRAFFIC SAFETY MAGAZINE FOR THE MILITARY DRIVER

JANUARY 1974

VOLUME 7 NUMBER 8

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THE EDITOR SPEAKS

DOUBLE CLUTCH

DO WINDOW STICKERS SCARE YOU?

All of us know that the suggested retail prices on the window stickers of new cars are fiction—nobody pays that amount. The sticker prices seems to be a kind of baseline, from which both the salesman and the customer know they will begin bargaining downward. It's a strange thing, because there are very few places in the U.S. where the price tag isn't a firm figure, take it or leave it. Try haggling at the BX or the local Sears and see where it gets you. But in the automobile business, it's a different story.

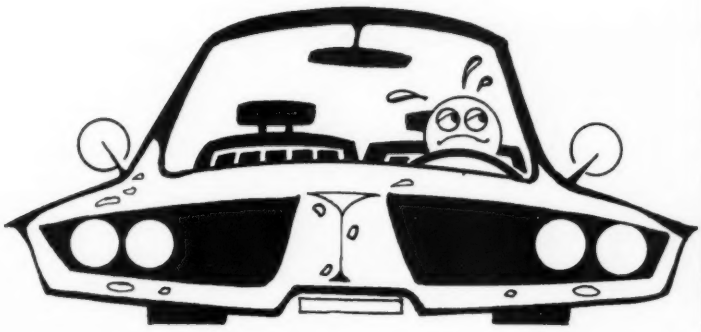
The real problem is, how do you know what a realistic price **is** for the car you have in mind? If you're lucky enough to be shopping in a very big metropolitan area where car dealers are in real competition, you can do some leg work and come up with six or eight quotes in an afternoon. You'll soon figure out for yourself how far below sticker price you can go. But if you're not in such an area—and most of us aren't—what do you do?

One method now available to you is to find out what the dealer himself paid for the car, then add on a reasonable amount for the dealer's profit. Several companies, which advertise in automotive magazines, now offer this service by mail. For a fee of $7.50 and a letter stating the make and model of your choice, you will receive a complete list of all the accessories and options available on that car. You check off the ones that interest you and return the list. Back comes a computerized printout, showing the dealer and retail figures for each item,

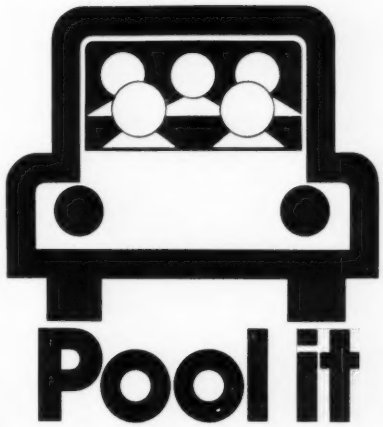
continued on page 28

NEXT MONTH

HYDROPLANING



Successful car pools need a simple set of rules about things like smoking, eating, and making interim stops. Everyone must agree on how long the pool will wait for the tardy member.



This logo spearheads The Highway Users Federation campaign to get more "rush hour" commuters into carpools. The Federation is an organization of about 600 business and industry groups dedicated to making highway transportation safe and efficient. Based in Washington, D.C., it is the nation's leader in the carpool movement.

according to a study conducted by the Highway Users Federation, it will do it cheaper than any other form of transportation.

IT SAVES YOU MONEY

Their study, called "Comparison of Urban Travel Economic Costs," is an analysis of expenses involved in commuting to and from central business districts in urban areas of over one million, by car, bus and rail transit, and various combinations. It boils down to this: carpools of two or more people are the most economical means of commuting.

For a typical 10-mile trip to work over a half-and-half mix of streets and freeways, the costs of each mode of travel were like this:

- The most expensive way to commute is alone by private automobile. This way that one-way trip costs $2.46.
- By comparison, a four-member carpool is much cheaper; 66 cents a person.
- If you don't mind crowding, a six-member carpool will cut that cost even more: to 44 cents each, to be exact.
- If you care to ride a non-express bus, then that trip will cost 86 cents a person; about 20 cents more than a four-person carpool.
- As for subways, surface rail, or elevated, you'll pay from $1.66 to $2.52, depending on how you get to or from the transit station.

But so much for the savings of carpools. Let's get back to cutting traffic jams.

IT EASES TRAFFIC

At present, the average automobile on a work trip in a major metro area contains approximately 1.6 people. If we could increase that to 2.0, about *20 per cent of the cars now on the road during rush hour could be gone —immediately!*

continued

"Pooling-It" isn't just for driving back and forth to work. How about neighbors doubling it up on that weekly safari to the commissary?

That's right. One out of every five cars in your daily communter crunch could be left home. Traffic could flow more easily, travel time could be cut, fuel could be conserved. Thanks to both fewer cars and less stop-and-go driving—there would be less pollution. With a little luck, there just might be proportionately fewer accidents, and our insurance rates might even go down in time.

But military facilities aren't usually located in downtown urban areas. Why should service men and women get together to pool it?

Because all of us who live outside the gate have to share the road with our civilian neighbors twice a day. When it's bumper to bumper, we're all the same. Their problems, our problems. Their pleasures, our pleasures. . . .

Then there are the personal things. Like not having to fight the driving every day, of being able to arrive relaxed. Like enjoying some good conversation, picking up some advice, learning something new, just talking sports or plain snoozing.

There's also that gas shortage. If you can keep your car home regularly, fuel is bound to be less of a problem and you may even find that you don't need two cars!

Local incentives can also make pooling it worthwhile. On the San Francisco-Oakland Bay Bridge, for example, carpools of three or more people cross with no toll charges. They also use special lanes so they can zip through the toll plaza with minimum delay.

Finally, if you work in D.C., you won't have to pay up to $2.75 a day to park.

DISADVANTAGES

On the other hand, there are some definite disadvantages to pooling it.

Most obvious is that the larger the car pool, the more inflexible the schedule. This means if you like to use your car to run errands during lunch, you'll have to plan them when it's your turn to drive.

Then you can always get stuck with a bad driver, creep carmates, a lousy pick-up place, or a back seat that sinks down to the drive shaft tunnel every time the car goes over a seam in the pavement.

For some people the solitary privacy of driving alone is also important. Obviously, privacy is not a feature of the carpool.

But by and large the advantages of pooling it far out-weigh driving alone. The trick is, how do you organize carpools in the military?

This is something that greatly depends on commanders. Although organizing a carpool program is not hard, success depends upon imaginative leadership.

MAKING IT WORK

First, cars, drivers and roads must be matched with people, starting places and destinations. This matching is most easily begun in small organizations where people already know each other. Next, matchings could be tried within large organizations where such information is still easily available, and "share-a-ride" cards can be circulated.

For intra-organizational matchings, a classified section in the unit newspaper could be used. "Share-a-ride" cards could also be used here for source data.

Second, there must be incentives to make people want to pool it. A successful incentive used by many civilian companies is prestige parking. In other words, reassign those RHIP parking places next to the front door to the carpoolers. The more members in the pool, the closer they park to the door. Reserved parking, of course.

It might also become necessary to stagger the working hours of some people. Again, this is not a big thing, just a break from tradition.

Now, once carpool members are potentially identified, grass roots organization is a must.

Complete agreement and understanding is necessary regarding pick-up places and times, driving schedules, sizes of cars, costs and payments. This latter is unnecessary when all members share driving on a regular basis.

It's also necessary that everyone agrees on the rules about:

- Waiting on the tardy.
- Interim stops.
- Smoking.
- Playing the radio.
- Air conditioning.
- Eating.
- Shop talk.

Once that is done, it's best to agree to try the pool for a specified period of time. That way if pooling doesn't work out, no one is up tight.

INSURANCE AND LAWS

By the way, it's also important that you understand insurance and the law.

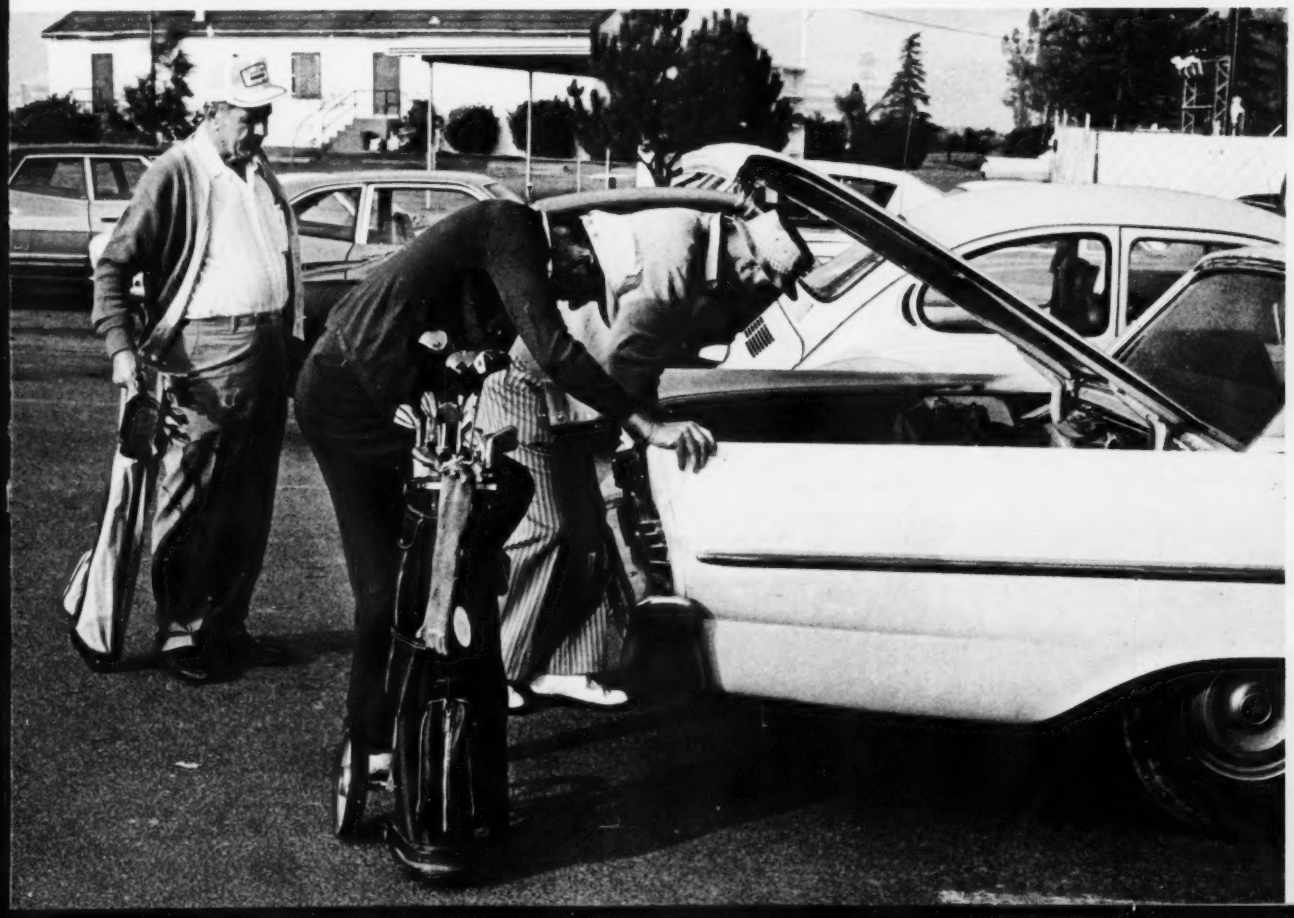
There is no simple explanation, because each state has its own laws. *In general,* this is the situation: People riding in your car are considered "guests," and your insurance company expects you will have guests. The laws of most states limit the liability the driver has to these guests passengers. Usually that means that if your passenger is injured while riding with you and he decides to sue, he has to prove you were "grossly negligent." But when a driver accepts payment from a passenger, the guest status may not apply and the driver might be liable for his ordinary negligence. Again, different states have different laws.

As carpooling becomes popular, you will find insurance information as it applies in your state will be appearing in your newspapers. If you have questions, call your agent. That's why he's there.

Your policy may be adequate, or you may need a simple, inexpensive addition to be properly protected. In Massachusetts, for example, an addi-

continued

Even before the fuel shortage, a lot of us were using chartered buses to go to major league ball games and amusement parks. It solved the parking problem and made the outing more fun. Now we should extend pooling to include other recreational activities. Why drive to the golf course alone?



tional $2.00 annual premium has been approved for carpool drivers.

MORE INFORMATION

If you would like publications detailing successful carpool programs, you may be interested in:

Car and Bus Pool Matching Guide, Public Transportation Branch, Urban Planning Division, U.S. Department of Transportation, Federal Highway Administration, Washington, DC 20509, 1973.

Computerized Carpool Matching at FHWA Headquarters, Ibid, 1973.

Industrial Package for Business and Industry, Operating Oxygen, P.O. Box 5975, Pasadena, California 91107, 1973.

Comparison of Urban Travel Economic Costs, Highway Users Federation, 1776 Massachusetts Avenue, N.W., Washington DC 20036, 1973.

Or for carpool matching and incentive programs successfully operating throughout the country, you may contact:

Lucille Fox, Connecticut Department of Transportation, 990 Weathersfield, Hartford, Connecticut 06114.

Jack Novak, Director, "Operation Oxygen", c/o The Burroughs Corporation, P.O. Box 5975, Pasadena, California 91107.

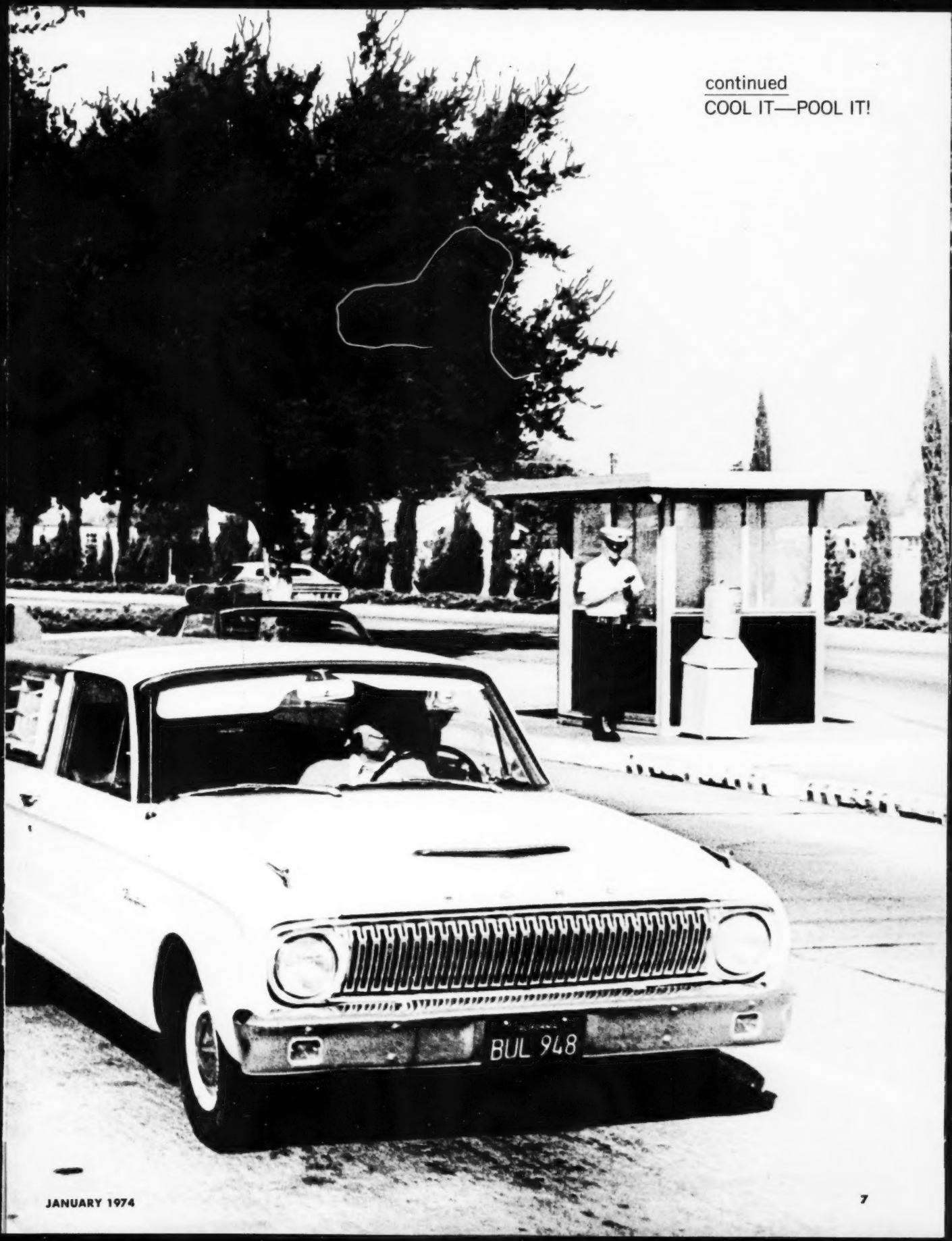
Allen Feinstein, Public Relations Director, McDonnell Douglas Corporation, Building 105, Level 4, Department K678, Box 516, St. Louis, Missouri 63166.

Robert K. Hennesy, Publicity Development Supervisor, General Offices, 3M Center, St. Paul, Minnesota 55101.

The situation is simple: carpools are a significant part of the solution to urban congestion, energy conservation, and lessening of air pollution. And today more and more people, from Congressmen to construction workers, are joining together to do something positive about these problems. There's room for a lot more.

In fact, this is the only movement we know of where the more who join, the fewer there are. POOL IT!

On most military installations, you don't have to go past the main gate to find traffic congestion. Sometime when you're driving through, check how many cars have more than one or two persons in them. Does yours?


BUL 948

Bob Tullius puts them through their paces for the cameras

You say you wouldn't recognize Liv Ullmann if she ate in your mess hall, and you only go to the base theater because you dig the popcorn? Okay, so you're not a fan of the flicks. But if you like first-rate driving by a first-rate driver, sometimes the best way to see it is in the movies.

So when we heard that the Sports Car Club of America (SCCA) was shooting a film at the Ontario Motor Speedway—just down the road from our office—we loaded up the cameras, put on the Hollywood shades, and went down to watch. The big attraction was Bob Tullius, four times SCCA national sports car champion, who was doing the driving for the pic. We knew he'd have some good words we could pass on in DRIVER.

The film is called "It's Up to You," and it's about unsafe automobile modifications. A fellow buys a second-hand car and then modifies it beyond its design capabilities. How he goes about the backyard work, and what finally happens to him and the car, is what the picture's all about.

The part of the film about design capabilities gives Tullius the chance to perform acceleration, braking and other demonstrations on a representative cross-section of cars most people drive: a Triumph Spitfire 1500, a Cadillac sedan, a Volkswagen sedan, a Chevrolet van, and an American Motors Matador sedan. The driving demonstrations show the movie audience how different vehicles handle under the same driving conditions.

VANS ARE DIFFERENT

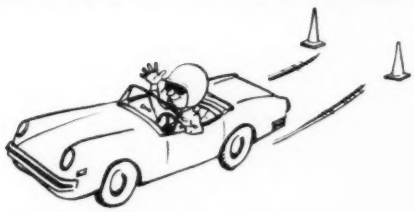
Bob began our visit by talking about the Chevy van. "It plays an important role in the film because so many people own and drive vans . . . and they drive them into places and under conditions the designers never dreamed of.

"In fact, the designers have had to come up with some real improvements in steering, suspension and brakes on their vans to meet these driver demands.

"The van's higher center of gravity

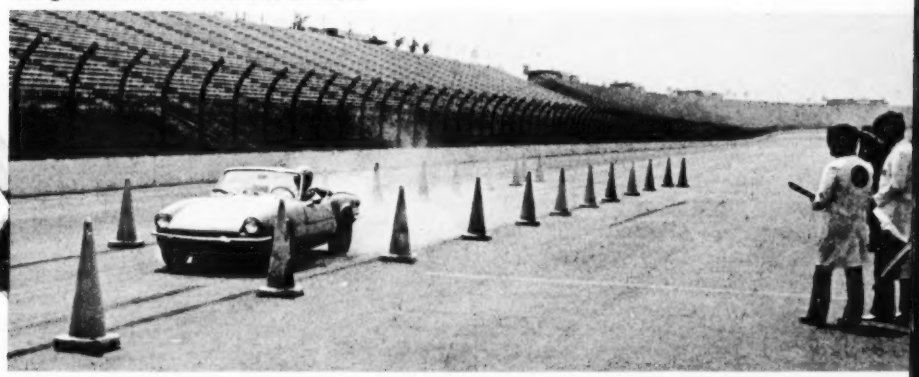
continued

DRIVING FOR THE Movies



The five cars used in the DOT film line up on the banked track.

Bob goes out on the track and drives it.



Electronic equipment gave positive readings for the acceleration and braking tests.

makes it easier to roll, but if it's handled properly and isn't forced into any really radical situation, the driver shouldn't get into trouble."

PLUG FOR THE HOBBY SHOP

Because he served in the Air Force before taking up pro racing, Bob Tullius knows a good place for the home mechanic to learn about car work is in the base auto hobby shop. "You can get expert advice in a shop like that," he said. "And they've got the right tools for you to work with."

(The film stresses that the man who does the mods on his car lacks both the proper tools and the know-how, so he ends up with a mish-mash job.)

"At the hobby shop you'll have shop manuals to follow," Bob said. "These are your best sources of information for any car job. They'll tell you exactly what you can and can't do to your car and still be running a safe vehicle."

TORTURE TESTS

During the filming, Bob pushed the five vehicles into and out of some strenuous maneuvers. He drove hard, so he never stepped into a car without putting on his helmet. Naturally he didn't turn a key until he was buckled in.

As the filming progressed Bob told us, "It's surprising how well all these cars handle. Even the van with its high center of gravity. They all per-

Bob Tullius discusses an upcoming test with the directors. . .

The Matador burns rubber on the skid pan.

formed very well—within their design limits."

Panic stops were made from 70 mph both on and off the skid pan. In each case, the top-heavy van needed the most distance to stop, and the little Spitfire with its race-bred brakes needed the least.

REACTION TIME COUNTS

Later, over a cup of coffee, Bob qualified his exceptionally good brake pedal reaction times in the tests: "According to the meter, I used up very few feet of road in reaction time before my foot hit the brakes at 70 mph. But I knew the stop was coming and my brain was geared for it. A normal reaction distance at that speed is about 90 feet. You have to add that reaction time when you are figuring your own distance for making a panic stop."

(far left)
No contest? The 10-speeder made it through the traps in 28 seconds, the 4-speed Triumph in less than a quarter of that time.

(middle left)
The Caddy plows into a hard left-hander as Bob pours the coal to her.

(near left)
The Spitfire takes the hard turns with a lot less lean; it is designed for such driving.

Bob's final job of the day was to push the cars through some S-curves to show how far they would lean and still be under control.

DON'T GIVE UP CONTROL

He said afterward that few drivers realize how far their cars can be pushed into a turn and still be kept in control. As a result, a lot of people get involved in accidents simply because they panic and give up control.

"If you find you're going too fast in a turn, don't take your foot right off the gas or you'll get a lot of sudden engine braking effect. That can give you more trouble.

"Just ease up on the gas slightly and hang in there. The tires will scream, and the car will lean. You'll probably get all shook up. But if you keep your cool, chances are good you'll make it."

DEADLY MODS

After the man in the film has modified his car, the handling characteristics are drastically changed. When he takes it onto the freeway for a test ride, it develops a tail wag as he accelerates into the traffic flow. The problem is badly adjusted shocks.

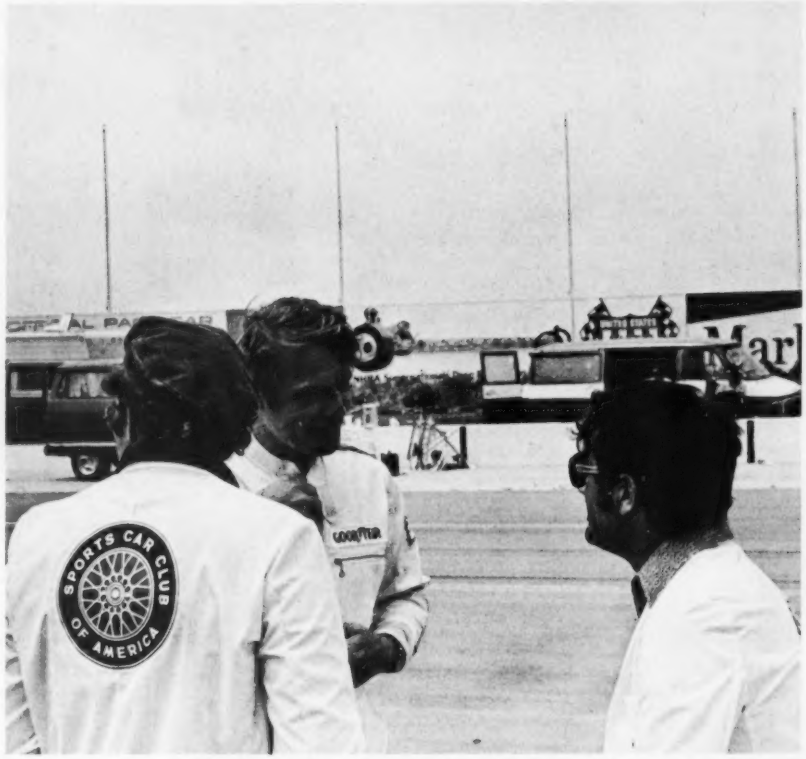
continued

He hangs with it, but as he rounds a curve in the road he sees a wreck ahead and has to slam on the brakes. The car swaps ends as it screeches to a stop. Grabbing brakes and the altered center of gravity that comes from the raked rear end add up to a bad situation.

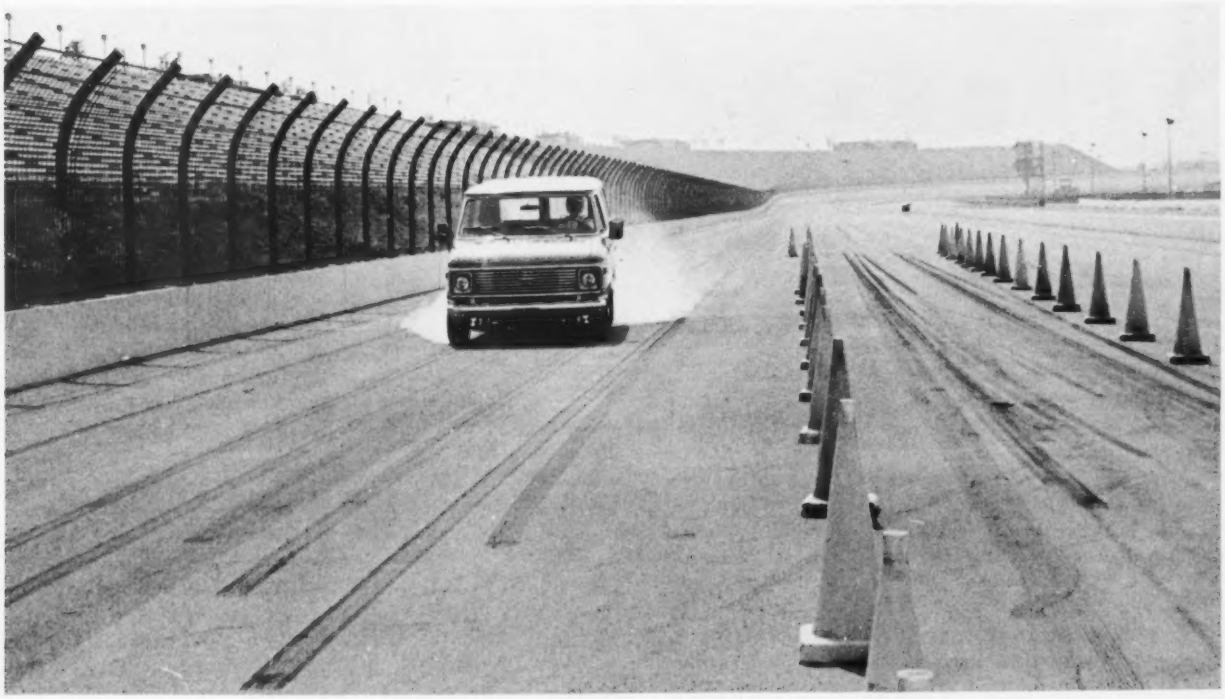
As Mark Donohue, one of the world's best drivers, and the film's narrator, sums up:

"Any car that has been modified as much as the car in this film is not a street car anymore. If you want to drive a highly-modified car, drive it on the track, not the street. And if you're going to make modifications, always use the best parts you can buy and work with an experienced mechanic."

Bob Tullius agrees. "A car just as it comes off the showroom floor performs a lot hotter than the average driver can handle safely. It's designed to accelerate, brake and handle extremely well, as I've demonstrated in this film. So why tamper with a good thing?"



Before any sequence is filmed, the driver, director and film technicians discuss possible camera angles and car maneuvers. Shooting a movie, DRIVER discovered, is nine-tenths discussion and one-tenth shooting.

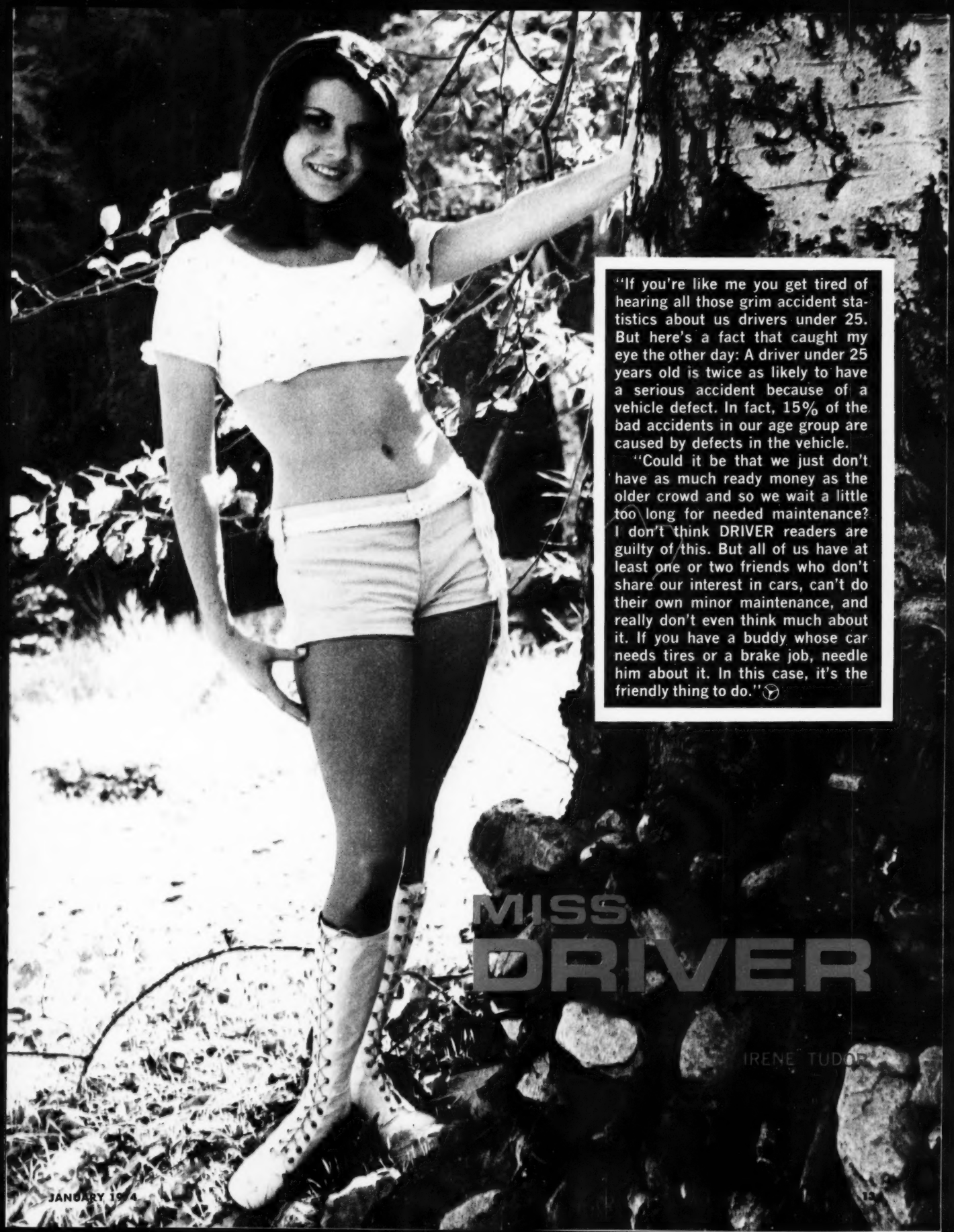


Skid marks show how hard brakes were clamped on for the panic stops.

"If you're like me you get tired of hearing all those grim accident statistics about us drivers under 25. But here's a fact that caught my eye the other day: A driver under 25 years old is twice as likely to have a serious accident because of a vehicle defect. In fact, 15% of the bad accidents in our age group are caused by defects in the vehicle.

"Could it be that we just don't have as much ready money as the older crowd and so we wait a little too long for needed maintenance? I don't think DRIVER readers are guilty of this. But all of us have at least one or two friends who don't share our interest in cars, can't do their own minor maintenance, and really don't even think much about it. If you have a buddy whose car needs tires or a brake job, needle him about it. In this case, it's the friendly thing to do."

MISS DRIVER



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MISS DRIVER

IRENE TUDOR

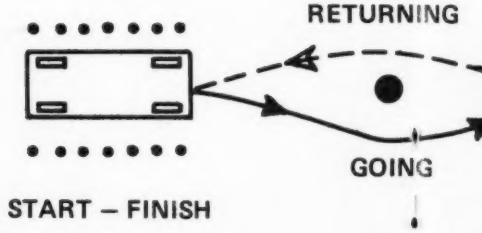
It's Fun t

One of the more pleasurable aspects of being your editor is getting away from the office to cover stories. A special treat is the annual trek to Michigan to report on the latest model cars. Last fall was no exception. But what really made it fun was winning a special gymkhana competition for members of the world automotive press.

You might be interested in some of the details of the course, should you care to set one up at your base. After all, a gymkhana offers a great way for drivers to compete safely where skill and fast reaction are the deciding factors, rather than high-speed, bumper-to-bumper competition. Besides, it's a breeze to set up a gymkhana, and you can give free rein to your imagination in devising a challenging course. Here's how the Chevrolet Motor Division's gymkhana worked.

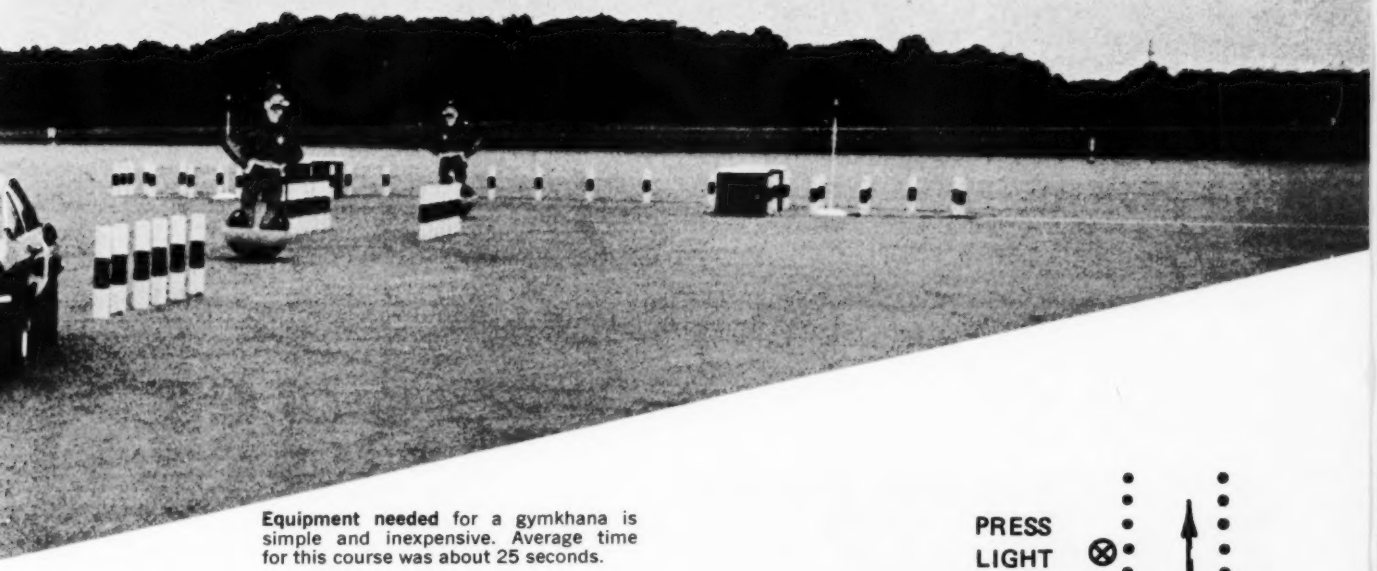
Figure one shows a handout given to each competitor with the complete

continued

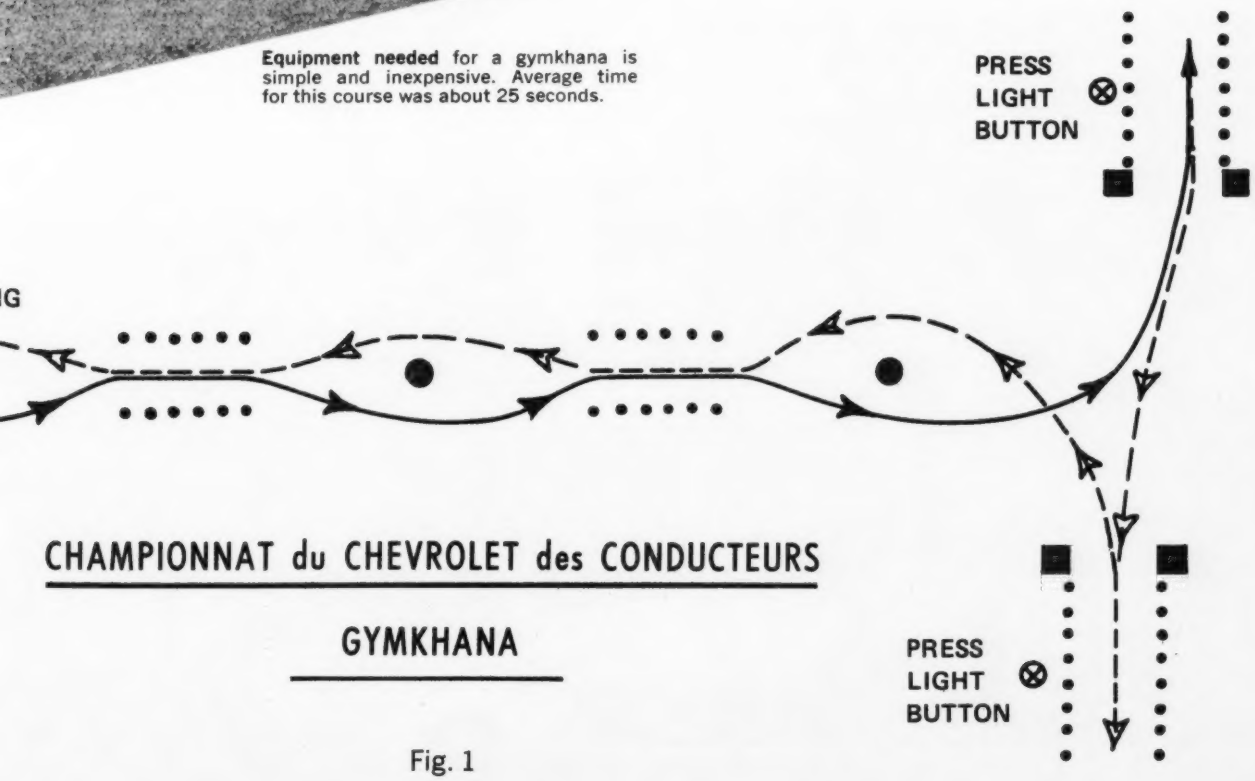


to Win...

ESPECIALLY A GYMKHANA



Equipment needed for a gymkhana is simple and inexpensive. Average time for this course was about 25 seconds.



CHAMPIONNAT du CHEVROLET des CONDUCTEURS

GYMKHANA

Fig. 1

layout of the course coming and going.

At the start the driver positions his car in a narrow stall established by plastic pylons. The instant he starts his run the timer is activated by the front wheels passing over a wire. For the sake of economy you could time the start and finish by using stopwatches and the averaging method described in November's feature about the autocross.

From here on it's a matter of neatly weaving around the dummy cardboard figures and through the narrow lanes of pylons. Smoothness and sustained speed are what counts. If you are too sloppy or hesitant with your steering or acceleration, it will show up and you won't have a chance of winning.

Then you come to the next test. Swinging into a simulated, narrow driveway you must stop, reach out and push a nearby button, then drive backwards into the opposite stall, and mash another button. But there's a problem here. The number two stall is not parallel to the first stall so you have to do some pretty nifty backward steering to avoid losing time or wiping out the stall altogether.

Then it's back through the course to the finish line, this time weaving around the obstacles in the opposite direction. It doesn't take long to complete the course—at least it shouldn't—but the 20 seconds or so involved tell you a lot about your driving ability as it applies to handling.

You are allowed one practice run-through. The next one is for time, with one second added to your total time for every cone you knock over. Brushing the large cardboard figures is permitted, within reason. But it's easy to get carried away, as did several zealots at this gymkhana who

This driver is just entering the first driveway stall where he must push a button to turn on the red light. The next step is a little harder because the opposite stall is offset to the left, a real test of backing skill when you are under the gun.

Through the first stall the driver sets up for a weave around the first obstacle. You can brush the traffic officer, but not displace him.

nearly orbited several of the simulated traffic officers.

One of the beauties of the gymkhana is its simplicity. Essential ingredients for the Chevrolet Gymkhana included cardboard pylons to mark the lanes, an electronic timer, three large, self-righting cardboard traffic officer figures, two small simulated brick structures (cardboard), and two button-activated rotating lights on metal poles.

This is one way to do it, and there are many others, limited only by the available materials and the imagination and interest of the people setting up the course. The point is, it's cheap, safe, challenging, instructive, competitive, and a lot of fun. What more do you want?

The winner.

Tank treads are only inches from the marker flags in the diminishing-clearance test.

Alley-docking is a Roadeo event.

LTG Charles Eifler honors SP/5 Shelby Bello for 200,000 accident-free miles trucking through Europe.

ARMY TRUCKERS

. . . They're Always Rolling

Almost everything used by the United States Army in Europe —rations, ammunition, mail and general cargo—is hauled by just one outfit: the 37th Transportation Group stationed in Kaiserslautern, Germany. The Group has 500 "customers" in Germany, Belgium, Luxembourg and The Netherlands.

Over a thousand drivers operate a huge assortment of tractors, trailers and refrigerator vans. Two companies of the Group have heavy equipment transporters—the only units of this type in the Army.

During the average three-month period, the 37th hauls more than 150,000 short tons of cargo a distance of 5½ million miles. They do it with a remarkable safety record under poor conditions: main highways similar to secondary roads in the states; no speed

How would you like to maneuver this baby through a diminishing-clearance event at the Roadeo? It's the largest wheeled vehicle in the Army inventory—an International Harvester Heavy Equipment Transporter (60 tons). The driver of this rig won the class competition.

limits; frequent fog and ice. Plus heavy traffic.

Winter driving in Europe is bad enough—with snow adding to the hazards of crowded roadways—but some drivers think the short summer seasons are even worse. That's when the tourists take to the road, and every European highway looks like rush hour in Chicago. Maybe even worse than Chicago, because—bumper to bumper—nobody slows down.

"No sweat," you say? "The average professional trucker state-side is good enough to take all this in stride." But newcomers to the 37th are far from being professional truckers. They gain their experience right on the job. In fact, the majority of the tractor/trailer drivers are under 20 years old, too young even to be licensed for this type rig back home.

So how do they get good enough to have the best safety record of any transportation unit in the Army in Europe?

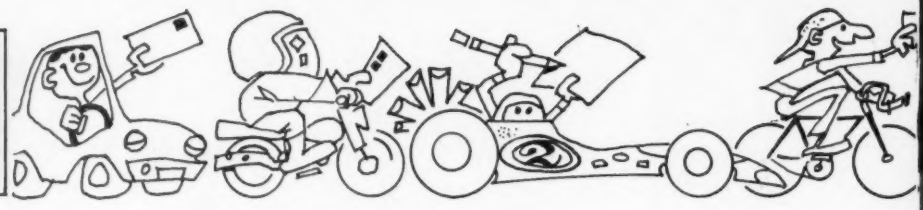
Primarily, it's training. A newly assigned man starts out in one of the three Drivers Academies run by the Group. After learning traffic laws, International Roads signs, map use and how to fill out all that paperwork connected with the hauling of cargo, he spends 16 hours on Operator's Maintenance. He has to know a lot about these big rigs just to perform the *before, during,* and *after operations* checks.

Next comes 10 days of practical experience on the driving strip. The driver performs maintenance, learns how to do everything from unlocking the door to shifting through the 10 gear ranges to parallel parking the trailer by jack-knifing the tractor.

Then he rides as passenger for 1500 miles with a senior driver. And finally drives 1500 miles with the senior driver as his passenger. After passing a checkride, the trainee is a qualified driver. But every 60 days he must pass another checkride. If he turns up with deficiencies, back he goes to Driver's Academy.

The photographs here were taken during the 37th's Roadeo. The best drivers of trucks, tractor/trailers and heavy equipment transports competed in a tough series of tests, starting with personal appearance and written examinations. Then through serpentine, offset alley, straight line, parallel parking, alley dock, diminishing clearance and stop-line events. If you think some of this precision driving is tough in a jeep, how would you like to try it in one of the rigs pictured here!

BACKFIRE

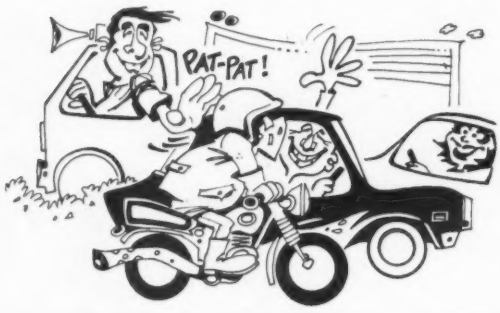


OCTOBER MOTORCYCLIST FEATURE

I just finished reading "The Motorcyclist (Who does he think he is?)" in your October issue. As an avid cyclist, I was really impressed by this article. I think LCDR Johnson covered everything expertly and really enjoys cycling and living. Let's hope someone else is reading besides motorcycle riders.

AZ3 Danny L. Fowler

AIMD, Hgr #1
Naval Air Station
Alameda, CA 94501



My thanks to LCDR Johnson for the October motorcycle article. I must confess to being one of those car drivers irritated by bikers hugging the center line and causing me to use the full left lane . . . just as I would have to do to pass another type of vehicle.

His explanation of biker defensive measures makes me feel foolish for my former attitude. As he says, knowledge of the other guy is the key to ending prejudice.

Lt Gary Minich, USNR-R

541 S. McClellan Ave
Decatur, IL 62522

Congratulations on a fine attempt to get four-wheel drivers to understand the motivations and rights of the cycle rider. But I must take exception to the illustration of the biker on pages 16 and 17. After spending 11 years on cycles in the AF and desperately trying to get good cycle clubs on different bases where I have been stationed, I feel the majority of ranking officials and supervisors view the biker in the "outlaw" version. I think your illustration will help further that image in their minds.

Keep up the fantastic articles on safe cycling . . . but please use better illustrations.

TSgt T. C. Moeglein

1106 Peterson Road
Colorado Springs, CO 80915

The illustration was designed with the idea of luring the non-rider into reading an article about motorcycles. Letters received from non-riders indicate they got the message and have a new view of the cyclist on the highway.

Please be assured DRIVER would never intentionally downgrade the cyclist. Our intention is precisely the opposite.

LETTERS TO THE EDITOR

BLASTED!

Your September "What Should You Do?" column about the stuck accelerator contains such unsound advice I had to respond. I cannot agree with three of the recommendations. If you shift into neutral this will let the engine race to beyond its maximum allowable design RPM which will destroy most engines. At the least it will be a very disconcerting noise which could distract or panic the driver. There is also the danger of flywheel disintegration with injury to the passengers or possibly an explosion which could cut fuel and brake lines.

Also, I cannot recommend braking in the central lane of the freeway for any reason except to maintain max clearance from traffic ahead.

As for signaling; I don't know the signal for a stuck throttle or blown flywheel!

Care should be used in columns of this caliber as they degrade an otherwise mediocre magazine.

TSgt Paul S. Bowen
Box 1163
APO San Francisco 96288

In our answer to the September "What Should You Do?" we state, "If you are certain that the steering will not be locked, you can kill the engine and get the added benefit of engine braking by turning off the ignition switch." With an older car, this would be the route to go. With a newer car with locking steering, however, take care to switch the key only to the "OFF" position to prevent possible locking of the steering.

Please remember we are talking about an ***emergency situation*** *where stopping forward acceleration is essential. Shifting to neutral is generally a quicker and more positive way to do this than fumbling with a possibly elusive ignition key while overtaking traffic. We feel an over-revved or possibly blown engine is a modest price to pay to avoid a high-speed collision.*

"What Should You Do?" situations and solutions come from a booklet entitled "MAYDAY, MAYDAY!" prepared by a group of safety experts. The foreword to the booklet acknowledges readers may not always agree with the suggested solutions. In fact, readers are encouraged to search for better solutions based on their own experience. The important thing is to be prepared for emergency situations with a planned, well-thought-out response.

WHAT SHOULD YOU DO?

I want to be added to a long list of people who have already said, "Thanks for a great magazine!"

On 19 November I was able to prevent what could have resulted in my serious injury by following a procedure outlined in one of the DRIVER issues. I had just crossed a bridge and was preparing to negotiate a 90-degree curve on a very icy road. As I prepared to turn my wheels I glimpsed a car through the left window. It was headed directly for my door, sliding out of control on the ice. I had a split second to react and I hit the accelerator to get ahead of the other car in hopes of having it miss me completely. It struck my left rear fender and did extensive damage to the fender and taillights, but fortunately no one was injured.

Again, thank you for a great magazine, and please keep up the good work with the "What Should You Do?"

SSgt Richard H. Crawford
3437 Instructor Squadron
Lowry AFB, CO 80230

BACKYARD MECHANIC—PAST, PRESENT, FUTURE

Your excellent magazine routinely flows into my IN box. I look forward to it and will probably have to enter a paid subscription if I can't find it at my next duty station.

I particularly enjoy the "Backyard Mechanic" feature. Could you print an index of topics already covered and an outline of future topics?

Keep up the good work!

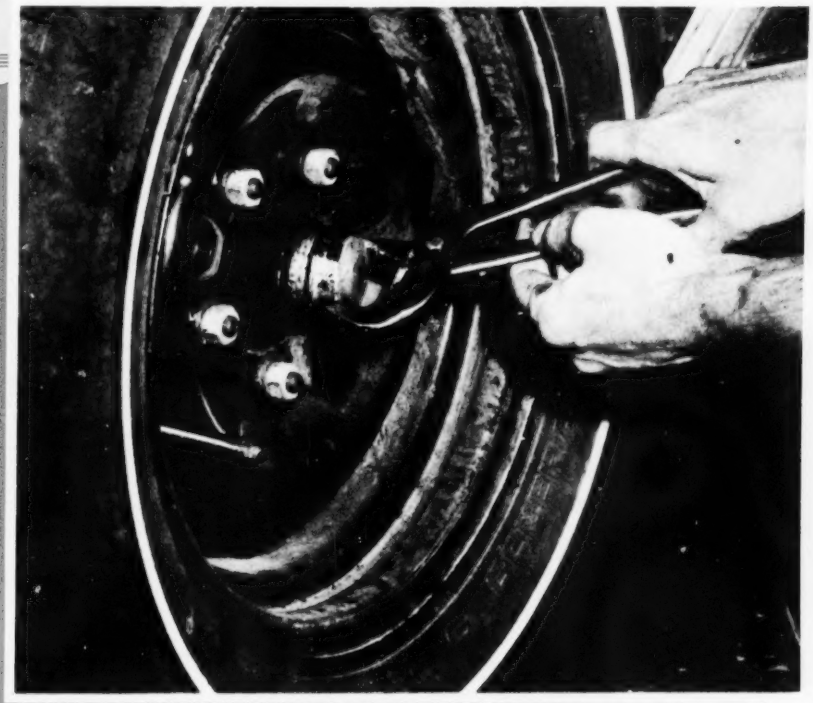
Maj Harry G. Foster, III
OPD Transportation Branch
(ADDRESS INCOMPLETE)

The preceding 11 installments of "The Backyard Mechanic" have concerned: Part I, Setting up your home work area and getting tools; Part II, Performing a general inspection of the car; Part III, Oil change and lube; Part IV, Automatic transmission maintenance; Part V, Disc brakes; Part VI, Cooling system; Parts VII and VIII, Emission control devices; Part IX, Using a vacuum gauge; Part X, How to stop your car from dieseling; Part XI, Batteries; and with this issue, Part XII, Wheel bearing repacking.

Incidentally, our technical editor, Sgt Bob Kays, has been muttering over his typewriter about what subjects to cover next. If you (or any of our readers) have any suggestions, please drop us a line.

Address your letters to:
Editor
DRIVER Magazine
AFISC/SEDD
Norton AFB CA 92409

On disc-brake-equipped cars the first step is removing the special locking plate (arrow) that holds the caliper in place. After removing the caliper, carefully suspend it from the car frame to prevent damaging the brake line. Check a service manual for the specifics of this job on your car.



After pulling the caliper on disc-brake-equipped cars or popping off the wheel cover on drum brake models, you must remove the bearing grease cap. The cap usually pulls off with pliers or vice grips, but you may need to pry it off with a screwdriver.

WHEEL BEARINGS

Almost everybody is concerned with how much gas their car uses these days—or at least we all should be. Most of us know that keeping our cars properly tuned and the tires correctly inflated helps cut fuel consumption. But plenty of other factors affect gas mileage. Like if your car rolls as if it's going up hill all the time your mileage is going to hurt. And many cars are always rolling up hill. Why? Simply because their owners neglect the wheel bearings.

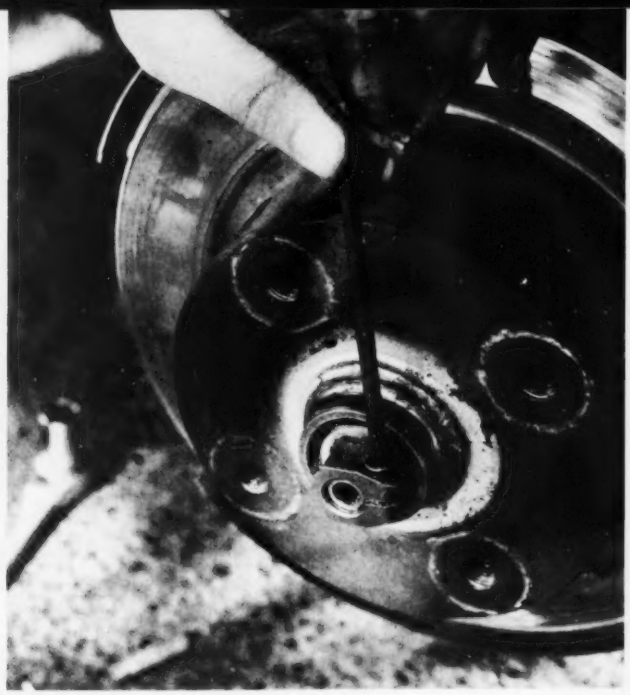
To keep things rolling along, your car's hard-working wheel bearings need to be regularly removed, cleaned, and repacked with grease. If they're not, the wheels won't roll freely, the car will use all kinds of extra gas, and if you run the bearings completely dry of lube the wheels will stop turning. If this happens you and your car may end up sliding down the road upside down like a friend of mine once did.

While neglecting your car's bearings is rarely this serious, keeping them

continued

THE BACKYARD MECHANIC

Set your bearings for better gas mileage



The wheel adjustment nut found under the cap is usually held in place by a nut lock and cotter pin. Straighten the pin and pull it through the wheel spindle with pliers. Remove the nut. Some foreign cars use a one-piece locking adjustment nut. The VW wheel (right) uses an Allen screw to lock the nut in place.

properly lubed and adjusted pays off. This is especially true considering the relative simplicity of doing your bearings. The job can be done in less than an hour with only a few common tools and parts that we'll mention later.

HOW OFTEN?

Wheel bearing maintenance specs vary. But on most newer cars the recommended service frequency is every 30,000 miles, with more frequent checks for proper bearing adjustment. Adjustment can be checked by jacking up the car until the tires are a few inches off the ground and shaking the top, bottom and sides of the tire. Excessive free play indicates needed bearing service. A worn or inadequately lubed bearing will also create a low growl or a squeak when the wheel is turned slowly.

Since adjustment inspections require jacking up the car (more than half the hassle of servicing bearings), it's just about as easy to go ahead and pull the bearings for cleaning and repacking every 15,000 or 20,000 miles. This

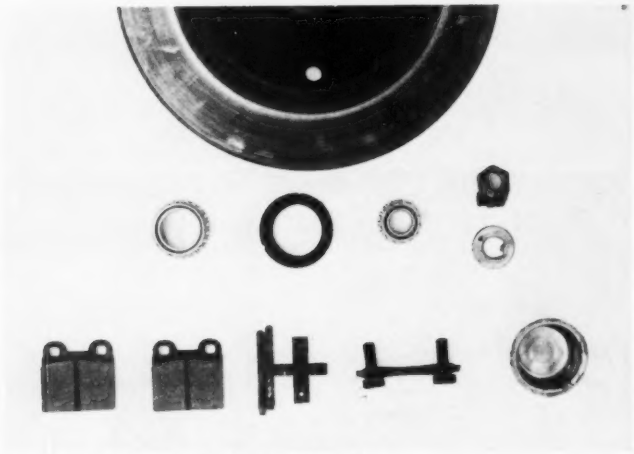
continued

Check the grease on the removed bearing. If it is very dark and smells burned, the bearing has been running hot and probably will need to be replaced. Wipe all the excess grease from the bearing and washer and drop them in a clean container of parts solvent. Be careful when handling solvent—some types can irritate or even burn your skin.

Rock the wheel (drum brakes) or the disc assembly (shown) to loosen it on the wheel spindle. This loosens the outer washer and bearing so they can be pulled off the spindle. On drum brake cars it may be necessary to back off the brake adjustment a bit to get the drum off. Check your manual for the procedure on this.

After you remove the outer washer, bearing, and bearing cup (if so equipped), carefully remove the wheel (drum brakes) or the disc assembly from the spindle. Lay the wheel or disc on a clean surface. Locate the inner grease seal and, being careful not to damage the inner bearing, pry it or tap it out with a screwdriver or brass drift. The bearing may drop out of the wheel when the grease seal is removed—place a rag under the wheel to prevent damage to the bearing if it does. If the bearing doesn't drop out, remove it and drop it into the solvent after checking for overheating and wiping off excess grease.

While the parts soak, clean the wheel spindle and inner hub with a clean rag.



Pour out the solvent and wipe all parts dry with a clean cloth. Check the bearings for discoloration (dark blue) which indicates overheating. Also check the bearings carefully for any damage such as chips or cracks. If there is any damage—replace the bearings. Place all removed parts on a clean surface, in the order in which they were removed, to air dry. Be as clean as possible—dirt is your bearing's worst enemy.

Inspect the brake system—check especially for cracked or damaged brake lines and proper thickness of disc pads or brake linings. (Check your manual for lining thickness specs.) Clean the brake assembly with denatured alcohol. If the pads or linings are glazed, rough them up with fine sand paper. Then coat the wheel spindle and hub with grease. Be sure not to get any grease on the brake pads or linings.

way you'll be reasonably sure everything is okay inside the wheels. Should you hear any unusual squeaks or growls from the front end, or if the car starts to wander all over the road, the bearings should be checked immediately.

SPECIFICS

Although wheel bearing service is pretty much the same on all cars, there are some differences. The biggest difference is between drum and disc-brake-equipped cars. We'll outline the basic procedure for both types, but be sure to check your manual for the exact procedures and specs for your car.

WHAT'S REQUIRED

To service your car's wheel bearings you need only a few items in addition to your trusty service manual, safety stands, a clean working surface, some clean rags, and basic assortment of tools. The additional items you'll need to pick up are good quality wheel bearing grease (if your car has disc brakes be sure to get the special high-temp grease designed for this use), some solvent for soaking parts clean, and —most importantly—new inner grease seals. Grease seals are available at most auto supply stores. When you're picking up the seals it's a good idea to check and see if the parts house has new bearings for your car—in case you find the old ones are worn when you get into them.

When you've accumulated these parts and tools you're all set. Park the car on a clean, flat surface like a driveway. On a disc-brake-equipped car you'll have to remove the wheels to get to the bearings, so loosen the lug nuts before raising the car. Jack up the front* of the car so the tires are just barely off the ground. Place the safety stands in position, being sure the locking pins are fully extended through the holes in the stands. Chock the rear wheels to keep the car from moving.

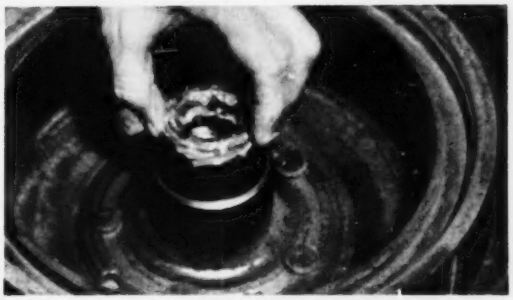
DISCS

With disc-brake-equipped cars the first step is removing the caliper assembly. This frees the disc so the bear-

continued

** Most cars have sealed rear bearings so only the front wheel bearings are serviceable. However, some import cars such as VW do have adjustable rear bearings—check your manual.*

If you don't have a bearing packer handy place a wad of grease in the palm of your hand and push the bearing down into the grease, forcing the lube up into the bearing. Turn the bearing as you go until you've packed the entire bearing. Then work the bearing with your fingers to thoroughly coat it with lube. Repeat the process on the second bearing.



Drop the inner bearing into the hub just as it came out (large side out). Coat the new grease seal with clean oil and set it into place. The seal can be seated by placing a socket over the seal and tapping on the socket. If you don't have a large enough socket, carefully tap around the seal with a hammer. Be sure the seal seats properly or grease may find its way to the brakes. Being careful not to damage the grease seal, place the wheel or disc in place on the spindle. Insert the lubed outer bearing just as it came out. Install the outer washer and turn the adjustment nut finger-tight. You're now ready to adjust the bearings.

Bearings should be set to the manufacturer's specs (given in your manual) with a torque wrench when possible. This is especially true with tapered roller bearings which can be easily damaged. But if you don't have a torque wrench, or a torque setting is not called for, you can get an accurate adjustment by feel. Seat the bearings by tightening the adjustment nut until you get a definite resistance when the wheel is rotated. Loosen the lock nut. Begin tightening the nut as you rotate the wheel —checking for free play as you go. Stop at the point where free play has been eliminated and the wheel turns freely. Install the nut lock and cotter pin. If the old pin is damaged or weak, be sure to replace it. Reinstall the grease cap and tap it into place. Now follow the same procedure on the other wheel and you're all set.

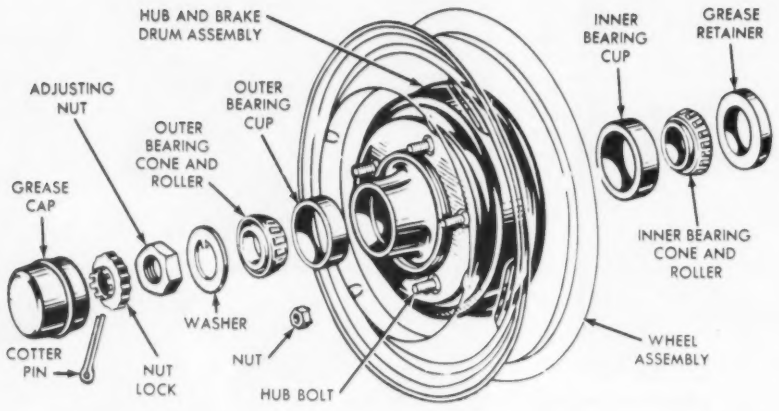


Fig. 1
Typical drum brake wheel assembly showing bearings. Note: Disc brake assemblies differ only slightly from the one shown.

continued

THE BACKYARD MECHANIC

ings can be removed. Your manual outlines the procedure. But, basically, the bolts holding the caliper to the backing plate must be removed to free the disc assembly. The caliper may have a special plate with lock tabs to lock the bolts against loosening. If so, carefully bend down the tabs before loosening the bolts. These tabs should be bent back into place when the caliper is replaced to make sure you don't lose your caliper during a hard brake sometime.

After you remove the caliper, hang it securely from the car frame or suspension system so the brake line is not stretched or damaged. In some cases the brake line may be long enough to allow resting the caliper on the ground. But don't let the caliper dangle by the brake line (a sure way to weaken the line and create a brake failure) or disconnect the line, unless you plan to bleed the brake system.

In some cases it also may be necessary to remove the disc brake pads from the caliper before it can be pulled from the disc. So it's a good idea to have new pads ready to pop in if the old ones are worn. See *The Backyard Machanic*, Part V, May '73 DRIVER for complete information on disc-brake pad replacement.

After the caliper on disc-brake-equipped cars has been removed or the wheel covers on drum brake cars popped off, servicing the bearings is essentially the same. The preceding photographs outline the procedure.

continued from page 3

DOUBLE CLUTCH

plus applicable freight and dealer charges. ("Computerized" because there are literally millions of combinations of styles, options and accessories. Only a computer can do the job.)

Consumer experts say a reasonable profit for the dealer is around $125. This may vary with the time of year (prices really do go down when new models are about to appear), with the type of car (domestic luxury models and foreign cars can command higher mark-ups), and with the popularity of the car (it's been a seller's market in economy models). But at least when you see a sticker price $800 over what you know the dealer paid, you'll know how to negotiate.

Answer to "WHAT SHOULD YOU DO?"

(See Back Cover—before reading)

Your decision to IMMEDIATELY USE YOUR FIRE EXTINGUISHER TO PUT OUT THE FIRE is by all means the best. If you don't own a fire extinguisher, you should buy one. Fire in automobiles is not a frequent problem, but when it happens it can be extremely serious. Fire extinguishers are so inexpensive that it's not worth taking a chance.

If you don't have an extinguisher, you can throw sand on this fire but not water or snow. Don't use water on electrical or gasoline fires. If you want to keep a box of baking soda in your car, that will do the job. Also, you want to pull the wire loose to break the short. Of course you won't use your bare hand. Grab a map or a rag if you don't have gloves.

ABOUT MISS DRIVER

(See page 13)

This month's Miss DRIVER is Irene Tudor. A bank escrow secretary, Irene is Ontario Motor Speedway Princess and has won her share of beauty titles. Although she's been driving only three years, the inconsiderate actions of other motorists have taught her to drive defensively. Irene is a brown-eyed brunette who plays softball, water skiis, and is assistant leader of a Girl Scout troop!

HOARDING—DON'T RISK IT

At this stage of the fuel crunch, we've all heard somebody say they are going to store extra gasoline away "just in case." The answer to that one is DON'T!

Most of us keep a small amount of gasoline on hand in a safety container for the cycle or the lawn mower and we know even that amount requires commonsense handling. (Did you realize the explosive power of one gallon of gasoline compares with 14 sticks of dynamite?) If an ignition source is present, even the safety can won't help once the gasoline vapors have escaped through the relief vent.

So the word is this: Don't keep more than a gallon or two on hand. Keep it in a safety can made just for the purpose, never in glass jars, plastic bottles or coffee cans. Keep it away from ignition sources such as clothes dryers and hot water heaters, in a well-ventilated area. Don't even think of 55-gallon drums, and argue long and loud with anybody who suggests it.

If you have to carry spare gas in your car to help someone who's stranded, put it in a container that has a label from a recognized testing authority. Don't fill the can full—leave room for expansion. Secure the can so it won't roll over. Provide for ventilation and don't carry it any longer than you have to.

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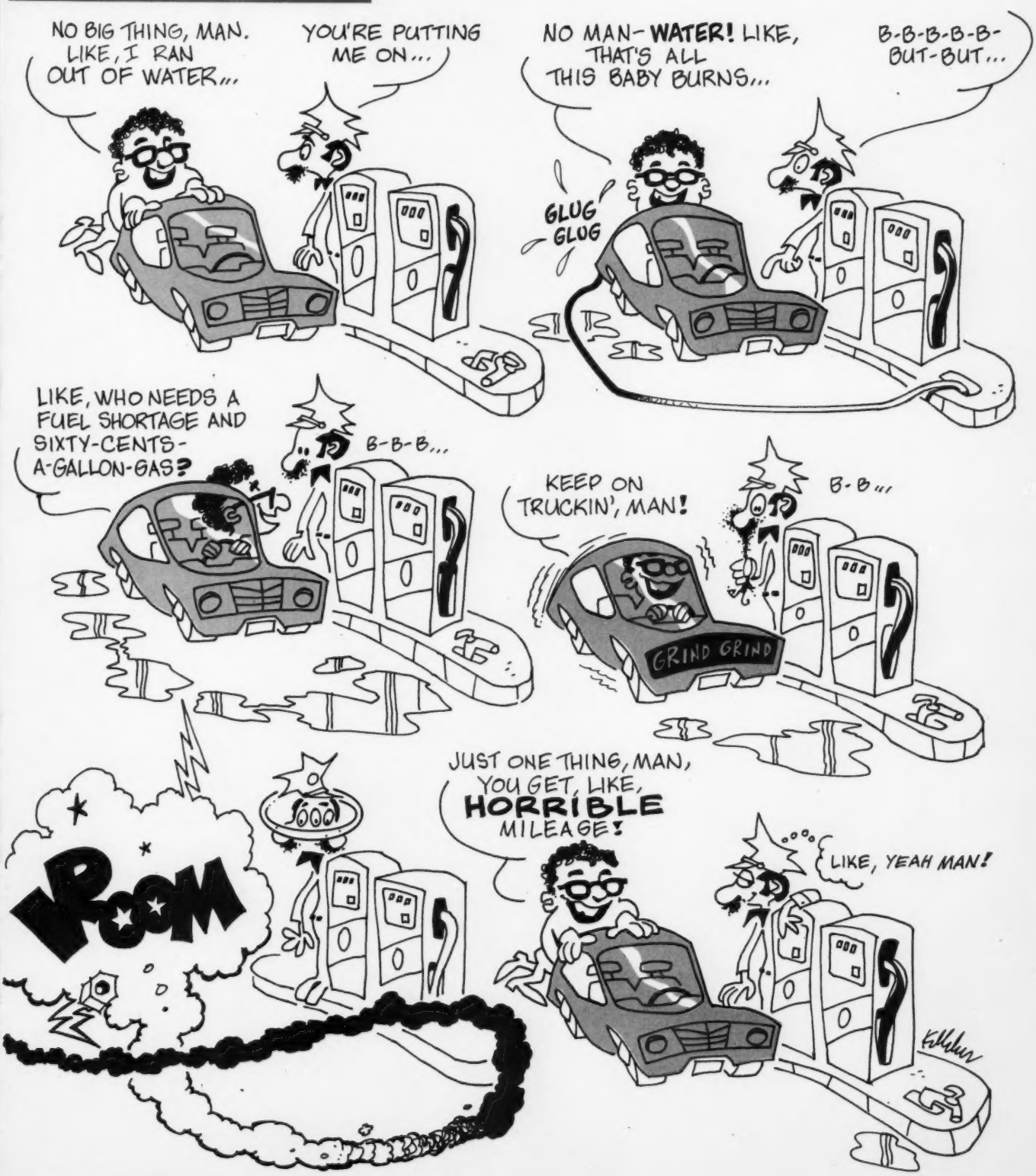
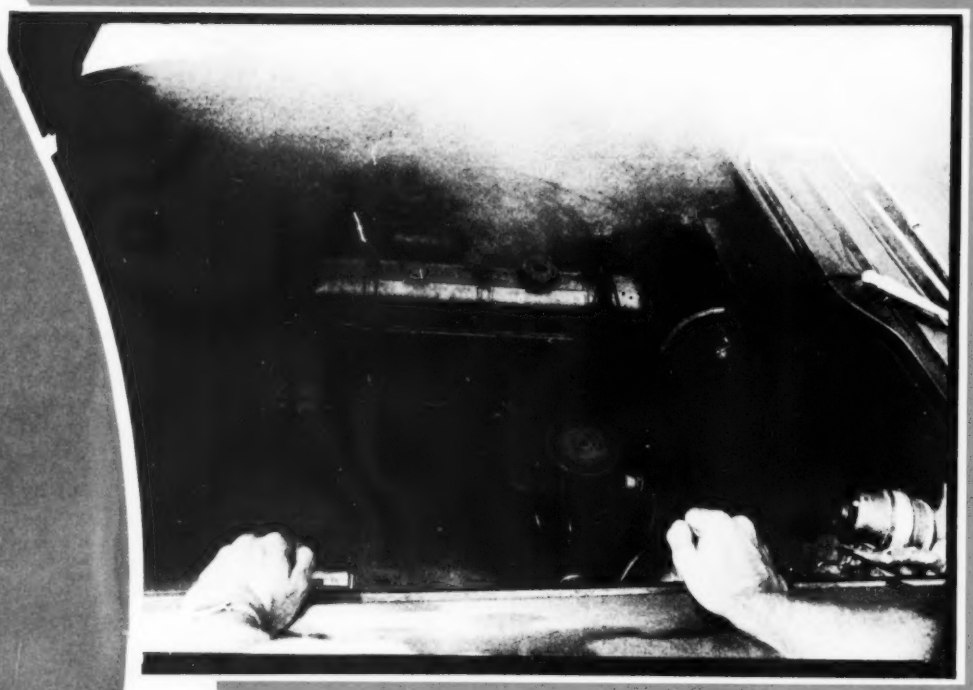
TUNEUP


NO BIG THING, MAN. LIKE, I RAN OUT OF WATER...
YOU'RE PUTTING ME ON...
NO MAN- WATER! LIKE, THAT'S ALL THIS BABY BURNS...
B-B-B-B-B-BUT-BUT...
GLUG GLUG
LIKE, WHO NEEDS A FUEL SHORTAGE AND SIXTY-CENTS-A-GALLON-GAS?
B-B-B...
KEEP ON TRUCKIN', MAN!
B-B...
GRIND GRIND
JUST ONE THING, MAN, YOU GET, LIKE, HORRIBLE MILEAGE!
LIKE, YEAH MAN!
KABOOM

What Should You Do?



While you are driving, you see smoke coming from under the hood of your car. You slow, stop and park in a safe emergency parking zone. You find that a short circuit has started a fire. What should you do?

A. Immediately use your fire extinguisher to put out the fire.

B. Put your hood up to show you're in trouble and throw sand, water or snow on the blaze.

C. Drive on until you find a gas station.

Answer on page 28